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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,931	07/03/2003	James R. Oikari	FSI0111/US	4635

7590 01/27/2005

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EXAMINER

CARRILLO, BIBI SHARIDAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

15

Office Action Summary	Application No.	Applicant(s)	
	10/613,931	OIKARI ET AL.	
	Examiner	Art Unit	
	Sharidan Carrillo	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/04/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6, 8-12, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Blackwood (4132567).

Blackwood teaches cleaning of wafers in a processing chamber followed by drying with ionized nitrogen gas to eliminate static electric charge from the wafer. In reference to claims 2-3, refer to col. 6, lines 5-7. In reference to claim 6, Blackwood teaches ionized nitrogen for drying the wafers. In reference to claim 8, col. 3, lines 40-43 teaches using the processing chamber for stripping and etching. In reference to claim 9, refer to col. 6 and 7 bridging, and col. 7, lines 25-30. In reference to claims 10-12, and 25, col. 6 and 7 bridging teaches introducing ionized nitrogen gas into the bowl during the rinsing cycle. In reference to claim 12, the limitations are inherently met as a result of introducing ionized nitrogen into the processing chamber containing the rinse water.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blackwood et al. (4132567) in view of Tomimori et al. (US2003/0013310).

Blackwood et al. teach the invention substantially as claimed with the exception of the antistatic agent comprising CO₂. Blackwood further fails to teach rinsing with CO₂. Tomimori et al. teach drying with nitrogen gas or CO₂ gas and further teaches treating the wafer with CO₂ in combination with water to decrease the electric charge on the wafer surface.

It would have been obvious to a person of ordinary skill in the art to modify the

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method of Blackwood to include using CO₂, as taught by Tomimori et al. for purposes of performing the same function of decreasing the electrostatic charge on the wafer surface.

7. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blackwood et al. (4132567) in view of Kobayashi (US2002/0045328).

Blackwood et al. teach the invention substantially as claimed with the exception of the antistatic agent comprising ionized air. Kobayashi teaches a device for the manufacture of semiconductor devices. In the abstract, Kobayashi teaches an ionizer for decreasing static charge in the semiconductor substrate. In paragraphs 3, 227, and 278, Kobayashi teaches blowing ionized air on the substrate to decrease the static charge.

It would have been obvious to a person of ordinary skill in the art to modify the method of Blackwood to include using ionized air, as taught by Kobayashi et al. for purposes of performing the same function of decreasing the electrostatic charge on the wafer surface.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blackwood et al. (4132567) in view of Tamaki et al. (5227001)

Blackwood et al. teach the invention substantially as claimed with the exception of IPA. Tamaki et al. teach wet stripping followed by drying with nitrogen or IPA to decrease the electrostatic discharge (col. 8, lines 50-62).

It would have been obvious to a person of ordinary skill in the art to modify the method of Blackwood to the use of equivalent means such as IPA, as taught by Tamaki et al. for purposes decreasing the electrostatic charge on the wafer surface.

Response to Arguments

9. Applicant argues that ionized nitrogen is not an antistatic agent based on the definition recited on page 12, lines 16-18. Applicant's arguments are unpersuasive since page 11, line 17 states that "any antistatic agent may be used so long as it is sufficiently compatible with the wafer and/or other processing gases or liquids. Additionally, page 11, lines 23-25 teaches carbon dioxide as an antistatic agent and further teaches that "Others include ionized dry air, ionized nitrogen or any gas that can be easily ionized". Additionally, the reference of Blackwood specifically states that ionized nitrogen gas eliminates static electric charge on the wafers. If ionized nitrogen is not an antistatic agent, then applicant's needs to provide a reasoning as to why applicant's own specification teaches ionized gas as an antistatic agent.

Nitrogen, carbon dioxide, and ionized air are art recognized as an antistatic agent. Applicant's own specification recognizes these compounds as antistatic agents. The anti-static nature is a chemical property of the composition, regardless of whether the composition is used in a wet or dry chemical process. As a result, one would reasonably expect carbon dioxide, nitrogen, or ionized air to decrease electric charge buildup during a wet or dry chemical process step since each of these gases are art recognized as possessing antistatic properties. Therefore, the rejections made proper based on the reasoning of substitution of known equivalent antistatic agents.

10. Applicant further argues that although Tomimori et al. teach an aqueous antistatic agent in a wet treatment, Tomimori does not provide any reason to use any antistatic agent during the drying process. Specifically, applicant argues that the reference only provides the use of gaseous CO₂ for providing a drying function during a drying step.

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Applicant's arguments are unpersuasive. It is well known in the art that CO₂ reduces electrostatic charge buildup (5938434, 5651834, US2003/0013310, 5409418). The prior art further teaches that carbon dioxide in solid, liquid, or gas phase reduces charge buildup. Although Tomimori is silent with respect of antistatic, Tomimori teaches using CO₂ gas which is well established in the art as having antistatic properties. Therefore, one would have reasonably expected carbon dioxide to reduce charge buildup since the antistatic nature is a chemical property of the composition and not a property of the wet or dry process being performed on the substrate surface. Additionally, Tomimori et al. is not relied upon to charge buildup during drying. The primary reference of Blackwood teaches the need to reduce charge buildup during drying by spraying ionized nitrogen. Tomimori et al. is relied on to teach using either nitrogen or carbon dioxide during drying and further teaches recognizing carbon dioxide as a compound which has the capability of reducing charge.

11. Applicant further agrees with the Examiner's conclusion that Kobayashi teaches an ionizer for ionizing ambient air for eliminating static charge. Applicant then argues that there is no motivation to combine the teachings of Blackwood with Kobayashi since Kobayashi fails to teach a drying step. Applicant's arguments are unpersuasive since Kobayashi is relied upon to teach equivalent antistatic agents in addition to ionized nitrogen. The rejection is proper since both references teach using an ionized gas to reduce charge buildup. The antistatic nature is a property of the ionized air, and not a property of the step being performed on the wafer surface.

12. It is noted that Applicant acquiesced to the rejection directed to Blackwood and Tamaki et al. since no arguments were presented.

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THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on Monday-Friday, 6:00a.m-2:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Sharidan Carrillo
Primary Examiner
Art Unit 1746

bsc



SHARIDAN CARRILLO
PRIMARY EXAMINER